

REMARKS

Claims 1 and 3-13 are pending in this application. By this Amendment, claim 1 is amended. Support for these amendments can be found, for example, at page 6, line 33 to page 8, line 30 of the specification. No new matter is added.

I. Allowed Claims

Applicant appreciates the Office Action's indication that claims 7-12 are allowed.

II. Claim Rejection

The Office Action rejects claims 1, 3-6 and 13 under 35 U.S.C. §103(a) over Japanese Laid-Open Patent Publication No. 2002-218793 to Moriya et al. (Moriya) in view of Japanese Laid-Open Patent Publication No. 08-289406 to Shiyamoto. Applicant respectfully traverses the rejection.

By this Amendment, claim 1 is amended to more clearly recite that the 2Y motor is connected to an internal combustion engine and that the 2Y motor is connected to the electric motor for at least one of supplying and receiving electric power therebetween for generating a driving force of a vehicle. In operation, the claimed 2Y motor steps-up and then steps-down the voltage between the internal combustion engine and the power supply, but the 2Y motor does not produce the torque that drives the vehicle wheels (see page 23, lines 24-26). Rather, the claimed electric motor generates the driving force of the vehicle. This has the benefit of allowing the claimed 2Y motor to apply all of the voltage generated in the step-up operation to the electric motor. Thus, as disclosed at page 23, lines 17-28, for example, the efficiency can be maximized.

Moriya discloses a 2Y motor 22 having three-phase coils 24 and 26. Moriya's 2Y motor 22 mechanically drives the vehicle in which power output unit 20 is situated. Moriya discloses that the output shaft of the 2Y motor 22 is the output shaft of the power output unit 20, and thus, the 2Y motor 22 is used as the vehicle driving motor. Moriya does not disclose

or suggest the use of 2Y motor 22 as a generator connected to an internal combustion engine, as acknowledged by the Office Action. In operation, the voltage used by 2Y motor 22 in driving the vehicle is not the maximum step-up voltage of the 2Y motor 22, but instead, the maximum step-up voltage is reduced by the voltage of the DC power supply 40 (see Drawing 1). Thus, Moriya suffers from less-than-maximum efficiency in its vehicle driving motor (2Y motor 22).

Shiyamoto discloses a vehicle power system comprising generator 20A, engine 26, and motor 10. In operation, engine 26 drives generator 20A which produces electrical output that is stored in battery 36 and electrical output that drives motor 10 which, in turn, drives wheels 12 (Drawing 1).

Regarding independent claim 1, one of ordinary skill in the art would not have been motivated to add the engine 26 of Shiyamoto to the power output unit 20 of Moriya "for improved control," as suggested by the Office Action, because adding an internal combustion engine to an electric engine would complicate the necessary control processing, not simplify or improve it. If the "control" cited by the Office Action refers to driver control of the vehicle, one of ordinary skill in the art still would not have been motivated to make the proposed combination because the addition of an internal combustion engine to a vehicle increases the weight and inertia, thus decreasing the responsiveness, and thus, control of the driver.

Further, one of ordinary skill in the art would not have been motivated to make the proposed combination because it would not be technically beneficial to do so. Under the proposed combination, Shiyamoto's engine 26 would drive the 2Y motor 22 of Moriya which drives the vehicle wheels as disclosed by Moriya. However, the proposed combination would also have motor 10 of Shiyamoto electrically coupled to 2Y motor 22, which would be redundant because 2Y motor 22 of Moriya already drives the vehicle wheels.

However, even if the power output unit 20 of Moriya is modified to include the engine 26 of Shiyamoto as proposed, the resulting combination fails to disclose "an electric motor connected to said 2Y motor ... for generating drive force of a vehicle" because the 2Y motor 22 already generates the drive force as disclosed by Moriya.

Regarding dependent claim 5, neither Moriya nor Shiyamoto, alone or in combination, discloses that the DC power supply 40 can be disconnected by the electronic control unit 50 (Moriya) or controller 22B (Shiyamoto). Thus, claim 5 is patentable for this additional reason.

For the foregoing reasons, Applicant requests withdrawal of the rejection.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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JAO:JHB/ccs

Date: June 11, 2007

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